US 20210099782A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2021/0099782 A1**

Dusan et al. (43) **Pub. Date: Apr. 1, 2021**

(54) **STATE CLASSIFICATION FOR AUDIO ACCESSORIES, AND RELATED SYSTEMS AND METHODS**

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(21) Appl. No.: **16/998,135**

(22) Filed: **Aug. 20, 2020**

Related U.S. Application Data

(60) Provisional application No. 62/907,397, filed on Sep. 27, 2019.

Publication Classification

(51) **Int. Cl.**

H04R 1/10	(2006.01)
H04R 3/00	(2006.01)
H04R 1/28	(2006.01)

(52) **U.S. Cl.**

CPC ***H04R 1/105*** (2013.01); ***H04R 3/00*** (2013.01); ***H04R 1/1016*** (2013.01); ***H04R 1/1075*** (2013.01); ***H04R 1/2896*** (2013.01)

(57) **ABSTRACT**

An earphone has a housing and a corresponding user-contact surface configured to urge against a user's anatomy. The housing defines an acoustic chamber and an acoustic port opening from the acoustic chamber. The user-contact surface is complementarily configured relative to the user's anatomy. When the earphone is donned, the user-contact surface forms an acoustic seal between the user-contact surface and the user's anatomy, acoustically coupling the acoustic chamber with the user's ear canal. An acoustic driver is positioned in the housing and acoustically coupled with the acoustic chamber. A microphone transducer acoustically couples with the acoustic port. A processing component is configured to detect a presence or an absence of anti-resonance in a spectral envelope observed by the microphone transducer.